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Fodstad et al.

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(54) **METHOD AND DEVICE FOR DETECTION OF SPECIFIC TARGET CELLS IN SPECIALIZED OR MIXED CELL POPULATIONS AND SOLUTIONS CONTAINING MIXED CELL POPULATIONS**

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Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

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(56) **References Cited**

U.S. PATENT DOCUMENTS

4,219,411 8/1980 Yen et al. .

(List continued on next page.)

FOREIGN PATENT DOCUMENTS

3811566 10/1988 (DE) .

(List continued on next page.)

OTHER PUBLICATIONS

Bennick et al., "A Rapid Method for Selecting Specific Hybridoma Clones using Paramagnetic Dynabeads," Scand. J. Immunol. 38:212-214, 1993.*

(List continued on next page.)

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(57) **ABSTRACT**

The invention relates to a method and apparatus for detecting specific target cells in a simple and time-saving way, using paramagnetic particles, antibodies recognizing the Fc portions of target-cell associating antibodies and target-cell associating antibodies directed to specific antigen determinants in the target-cell membranes. Incubation of the cell suspension with detergent and/or second antibodies or antibody fragments, prelabeled or not with fluorescent agents, metalcolloids, radioisotopes, biotin complexes or certain enzymes allowing visualization, dramatically increase the specificity of the method. The method and apparatus described provides a solid support and permanent record which is easily viewed by microscopy, permits viewing and quantification of the whole specimen rather than small fractions thereof and allows the use of large specimen volumes to be analysed, the device may also be scanned automatically by conventional densitometric technology. The method and apparatus can be used for isolation of the target cells by magnetic field application, and a kit and apparatus for performing the method according to the invention is described.

88 Claims, 5 Drawing Sheets

